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 NEWS  7  Jun 28  Additional enzyme-catalyzed reactions added to CASREACT
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 NEWS 14  AUG 02  The Analysis Edition of STN Express with Discover!
                  (Version 7.01 for Windows) now available
 NEWS 15  AUG 04  Pricing for the Save Answers for SciFinder Wizard within
                  STN Express with Discover! will change September 1, 2004
 NEWS 16  AUG 27  BIOCOMMERCE: Changes and enhancements to content coverage
 NEWS 17  AUG 27  BIOTECHABS/BIOTECHDS: Two new display fields added for legal
                  status data from INPADOC
 NEWS 18  SEP 01  INPADOC: New family current-awareness alert (SDI) available
 NEWS 19  SEP 01  New pricing for the Save Answers for SciFinder Wizard within
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 NEWS 20  SEP 01  New display format, HITSTR, available in WPIDS/WPINDEX/WPIX
 NEWS 21  SEP 14  STN Patent Forum to be held October 13, 2004, in Iselin, NJ

 NEWS EXPRESS  JULY 30 CURRENT WINDOWS VERSION IS V7.01, CURRENT
               MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP),
               AND CURRENT DISCOVER FILE IS DATED 11 AUGUST 2004
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COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	0.21	0.21

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FILE COVERS 1907 - 14 Sep 2004 VOL 141 ISS 12
FILE LAST UPDATED: 13 Sep 2004 (20040913/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

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COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	0.44	0.65

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FILE COVERS 1907 - 14 Sep 2004 VOL 141 ISS 12
FILE LAST UPDATED: 13 Sep 2004 (20040913/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s carbon monoxide (l) hydrogen (l) carbon dioxide (l) water (l) methanol

```
        1074557 CARBON
          23925 CARBONS
        1083274 CARBON
                  (CARBON OR CARBONS)
         161023 MONOXIDE
            961 MONOXIDES
         161535 MONOXIDE
                  (MONOXIDE OR MONOXIDES)
         136127 CARBON MONOXIDE
                  (CARBON(W)MONOXIDE)
         835326 HYDROGEN
           5420 HYDROGENS
         838372 HYDROGEN
                  (HYDROGEN OR HYDROGENS)
        1074557 CARBON
          23925 CARBONS
        1083274 CARBON
                  (CARBON OR CARBONS)
         417334 DIOXIDE
           6352 DIOXIDES
         418937 DIOXIDE
                  (DIOXIDE OR DIOXIDES)
         195179 CARBON DIOXIDE
                  (CARBON(W)DIOXIDE)
        2162050 WATER
         241121 WATERS
        2214777 WATER
                  (WATER OR WATERS)
         170202 METHANOL
            660 METHANOLS
         170548 METHANOL
                  (METHANOL OR METHANOLS)
L1           70 CARBON MONOXIDE (L) HYDROGEN (L) CARBON DIOXIDE (L) WATER (L)
                METHANOL

=> s l1 and liquid phase
         660109 LIQUID
         120283 LIQUIDS
         751153 LIQUID
                  (LIQUID OR LIQUIDS)
         912082 LIQ
          87020 LIQS
         945866 LIQ
                  (LIQ OR LIQS)
        1317126 LIQUID
                  (LIQUID OR LIQ)
        1519688 PHASE
         322509 PHASES
        1656330 PHASE
                  (PHASE OR PHASES)
         101714 LIQUID PHASE
                  (LIQUID(W)PHASE)
L2            2 L1 AND LIQUID PHASE

=> d l2 ibib ab 1-2

L2   ANSWER 1 OF 2  CAPLUS  COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:         2002:477060  CAPLUS
DOCUMENT NUMBER:          137:249446
TITLE:                    Kinetics of liquid-phase methanol
                          synthesis over a Cu/ZnO/MnO3/Al2O3 catalyst
AUTHOR(S):                Nowicki, Lech
CORPORATE SOURCE:         Wydz. Inz. Procesowej i Ochrony Srodowiska, Politech.
                          Lodzka, Lodz, 90-924, Pol.
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SOURCE: Inzynieria Chemiczna i Procesowa (2002), 23(1), 83-98
CODEN: ICPRDT; ISSN: 0208-6425
PUBLISHER: Oficyna Wydawnicza Politechniki Wroclawskiej
DOCUMENT TYPE: Journal
LANGUAGE: Polish

AB Exptl. data for low-pressure **methanol** synthesis over Polish com. Cu/ZnO/MnO3/Al2O3 catalyst, obtained in a bench-scale stirred-tank slurry reactor were used for kinetic modeling of this process. Exptl. conditions were varied in the range as follows: slurry temperature of 493-523 K, reactor pressure of 3-5 MPa, space velocity of 0.66-3.16 10-3 m3·kg-1·s-1, and H2/CO feed gas ratio 1.6-4.0. Although it is believed that **carbon dioxide** is the main source of carbon in **methanol** synthesized on copper-containing catalysts and CO is converted to CO2 via **water** gas-shift reaction, the direct hydrogenation of CO to **methanol** cannot be entirely excluded. Thus the best way of modeling this reaction is take into account both routes. The model developed in this paper is based on three overall reactions: hydrogenation of CO and CO2, and the **water** gas-shift. A detailed reaction network, derived from mechanistic consideration reported recently in the literature, is used as a basis for the development of the rate expressions. It was assumed that **methanol** is formed from adsorbed **hydrogen** atoms and **carbon monoxide** mols. via partially hydrogenated species such as HCO, H2CO and H3CO. The surface reaction between methoxy species (H3CO) and adsorbed **hydrogen** atoms is the rate-determining step. The synthesis of **methanol** from **carbon dioxide** occurs via formate species (HCO2) adsorbed on the catalyst surface and hydrogenation of this species is the rate-determining step in CO2 hydrogenation pathway. **Methanol** desorbs leaving adsorbed oxygen atoms on the catalyst surface. These atoms can be removed by CO to give **carbon dioxide** or they react with **hydrogen** to form **water**. The kinetic model was derived by using Langmuir-Hinselwood formalism and steady-state approximation for reaction intermediates. Molar concentration of reagents in a slurry phase used in kinetic equations for elementary steps were subsequently replaced by more convenient partial pressures in a gas phase using Henry's law. The expts. were designed in such a way that all mass transfer resistances could be negligible, so it was assumed the gas phase and the **liq. phase** to be in thermodynamical equilibrium The kinetic model for **liq.-phase methanol** synthesis developed in this study is given in Table 1. The parameters ests. were obtained by minimizing the performance index using the exptl. determined rates of **methanol** and **water** formation. All the parameter values obtained are listed. The model accurately predicts the rate of formation of **methanol** and **water** in the whole range of operating conditions employed for this study. The quality of the fit is shown, where the exptl. values of **methanol** and **water** rates of production are plotted against the estimated ones. The model developed in the present study was used for simulation of the process to examine the effect of operating conditions on the rate of formation of **methanol** from CO and CO2. The calcn. Showed that **methanol** is formed mainly from CO2 and the extent of CO hydrogenation increased with increasing of temperature, pressure and residence time. It also depends on feed gas composition

L2 ANSWER 2 OF 2 CAPLUS
ACCESSION NUMBER: 1996:321345 CAPLUS
DOCUMENT NUMBER: 124:346545
TITLE: Manufacture of methanol from waste gas containing carbon dioxide via reverse water gas shift reaction
INVENTOR(S): Uhm, Sung Jin; Han, Seong Hwan; Song, Suk Mok; Joo, Oh Shim
PATENT ASSIGNEE(S): Korea Institute of Science and Technology, S. Korea
SOURCE: PCT Int. Appl., 18 pp.
CODEN: PIXXD2

DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
WO 9606064	A1	19960229	WO 1995-KR109		19950819
W: JP, US					
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE					
KR 138587	B1	19980501	KR 1994-20457		19940819
JP 09510734	T2	19971028	JP 1995-507956		19950819
PRIORITY APPLN. INFO.:			KR 1994-20457	A	19940819
			WO 1995-KR109	W	19950819

AB MeOH is economically produced from CO_2 in a high yield by a process which comprises compressing a gaseous mixture of CO_2 and H, introducing the compressed gaseous mixture into a conversion column, converting a part of the CO_2 contained in the mixture to CO in the presence of catalyst to produce a gas phase mixture and a **liq. phase** mixture, removing the **liq. phase** mixture in a gas-liquid separator, introducing the gas phase mixture from the gas-liquid separator into a reactor while recycling, optionally, a part of the mixture into the conversion column, reacting the compressed gas phase mixture introduced into the reactor in the presence of a catalyst to produce a mixture containing MeOH, and recovering MeOH as a **liq. phase** product from the mixture

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               MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP),
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                                                       ENTRY    SESSION
FULL ESTIMATED COST                                     0.21       0.21

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FILE LAST UPDATED: 13 Sep 2004  (20040913/ED)

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COST IN U.S. DOLLARS                              SINCE FILE      TOTAL
                                                       ENTRY    SESSION
FULL ESTIMATED COST                                     0.44       0.65

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FILE COVERS 1907 - 14 Sep 2004  VOL 141 ISS 12
FILE LAST UPDATED: 13 Sep 2004  (20040913/ED)

  This file contains CAS Registry Numbers for easy and accurate
  substance identification.

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=> s carbon monoxide (l) hydrogen (l) carbon dioxide (l) water (l) methanol
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```
       1074557 CARBON
         23925 CARBONS
       1083274 CARBON
                 (CARBON OR CARBONS)
        161023 MONOXIDE
           961 MONOXIDES
        161535 MONOXIDE
                 (MONOXIDE OR MONOXIDES)
        136127 CARBON MONOXIDE
                 (CARBON(W)MONOXIDE)
        835326 HYDROGEN
          5420 HYDROGENS
        838372 HYDROGEN
                 (HYDROGEN OR HYDROGENS)
       1074557 CARBON
         23925 CARBONS
       1083274 CARBON
                 (CARBON OR CARBONS)
        417334 DIOXIDE
          6352 DIOXIDES
        418937 DIOXIDE
                 (DIOXIDE OR DIOXIDES)
        195179 CARBON DIOXIDE
                 (CARBON(W)DIOXIDE)
       2162050 WATER
        241121 WATERS
       2214777 WATER
                 (WATER OR WATERS)
        170202 METHANOL
           660 METHANOLS
        170548 METHANOL
                 (METHANOL OR METHANOLS)
L1          70 CARBON MONOXIDE (L) HYDROGEN (L) CARBON DIOXIDE (L) WATER (L)
               METHANOL

=> s l1 and liquid phase
        660109 LIQUID
        120283 LIQUIDS
        751153 LIQUID
                 (LIQUID OR LIQUIDS)
        912082 LIQ
         87020 LIQS
        945866 LIQ
                 (LIQ OR LIQS)
       1317126 LIQUID
                 (LIQUID OR LIQ)
       1519688 PHASE
        322509 PHASES
       1656330 PHASE
                 (PHASE OR PHASES)
        101714 LIQUID PHASE
                 (LIQUID(W)PHASE)
L2           2 L1 AND LIQUID PHASE

=> d l2 ibib ab 1-2
```

L2 ANSWER 1 OF 2 CAPLUS

ACCESSION NUMBER: 2002:477060 CAPLUS
DOCUMENT NUMBER: 137:249446
TITLE: Kinetics of **liquid-phase** methanol synthesis over a Cu/ZnO/MnO3/Al2O3 catalyst
AUTHOR(S): Nowicki, Lech
CORPORATE SOURCE: Wydz. Inz. Procesowej i Ochrony Srodowiska, Politech. Lodzka, Lodz, 90-924, Pol.

SOURCE: Inzynieria Chemiczna i Procesowa (2002), 23(1), 83-98
CODEN: ICPRDT; ISSN: 0208-6425
PUBLISHER: Oficyna Wydawnicza Politechniki Wroclawskiej
DOCUMENT TYPE: Journal
LANGUAGE: Polish

AB Exptl. data for low-pressure **methanol** synthesis over Polish com. Cu/ZnO/MnO3/Al2O3 catalyst, obtained in a bench-scale stirred-tank slurry reactor were used for kinetic modeling of this process. Exptl. conditions were varied in the range as follows: slurry temperature of 493-523 K, reactor pressure of 3-5 MPa, space velocity of 0.66-3.16 10-3 m3·kg-1·s-1, and H2/CO feed gas ratio 1.6-4.0. Although it is believed that **carbon dioxide** is the main source of carbon in **methanol** synthesized on copper-containing catalysts and CO is converted to CO2 via **water** gas-shift reaction, the direct hydrogenation of CO to **methanol** cannot be entirely excluded. Thus the best way of modeling this reaction is take into account both routes. The model developed in this paper is based on three overall reactions: hydrogenation of CO and CO2, and the **water** gas-shift. A detailed reaction network, derived from mechanistic consideration reported recently in the literature, is used as a basis for the development of the rate expressions. It was assumed that **methanol** is formed from adsorbed **hydrogen** atoms and **carbon monoxide** mols. via partially hydrogenated species such as HCO, H2CO and H3CO. The surface reaction between methoxy species (H3CO) and adsorbed **hydrogen** atoms is the rate-determining step. The synthesis of **methanol** from **carbon dioxide** occurs via formate species (HCO2) adsorbed on the catalyst surface and hydrogenation of this species is the rate-determining step in CO2 hydrogenation pathway. **Methanol** desorbs leaving adsorbed oxygen atoms on the catalyst surface. These atoms can be removed by CO to give **carbon dioxide** or they react with **hydrogen** to form **water**. The kinetic model was derived by using Langmuir-Hinselwood formalism and steady-state approximation for reaction intermediates. Molar concentration of reagents in a slurry phase used in kinetic equations for elementary steps were subsequently replaced by more convenient partial pressures in a gas phase using Henry's law. The expts. were designed in such a way that all mass transfer resistances could be negligible, so it was assumed the gas phase and the **liq. phase** to be in thermodynamical equilibrium The kinetic model for **liq.-phase methanol** synthesis developed in this study is given in Table 1. The parameters ests. were obtained by minimizing the performance index using the exptl. determined rates of **methanol** and **water** formation. All the parameter values obtained are listed. The model accurately predicts the rate of formation of **methanol** and **water** in the whole range of operating conditions employed for this study. The quality of the fit is shown, where the exptl. values of **methanol** and **water** rates of production are plotted against the estimated ones. The model developed in the present study was used for simulation of the process to examine the effect of operating conditions on the rate of formation of **methanol** from CO and CO2. The calcn. Showed that **methanol** is formed mainly from CO2 and the extent of CO hydrogenation increased with increasing of temperature, pressure and residence time. It also depends on feed gas composition

L2 ANSWER 2 OF 2 CAPLUS
ACCESSION NUMBER: 1996:321345 CAPLUS
DOCUMENT NUMBER: 124:346545
TITLE: Manufacture of methanol from waste gas containing carbon dioxide via reverse water gas shift reaction
INVENTOR(S): Uhm, Sung Jin; Han, Seong Hwan; Song, Suk Mok; Joo, Oh Shim
PATENT ASSIGNEE(S): Korea Institute of Science and Technology, S. Korea
SOURCE: PCT Int. Appl., 18 pp.
CODEN: PIXXD2

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DOCUMENT TYPE:          Patent
LANGUAGE:               English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

     PATENT NO.          KIND   DATE       APPLICATION NO.        DATE
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     WO 9606064          A1     19960229   WO 1995-KR109          19950819
         W:  JP, US
         RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE
     KR 138587           B1     19980501   KR 1994-20457          19940819
     JP 09510734         T2     19971028   JP 1995-507956         19950819
PRIORITY APPLN. INFO.:                     KR 1994-20457       A  19940819
                                           WO 1995-KR109       W  19950819
```

AB MeOH is economically produced from CO2 in a high yield by a process which comprises compressing a gaseous mixture of CO2 and H, introducing the compressed gaseous mixture into a conversion column, converting a part of the CO2 contained in the mixture to CO in the presence of catalyst to produce a gas phase mixture and a **liq. phase** mixture, removing the **liq. phase** mixture in a gas-liquid separator, introducing the gas phase mixture from the gas-liquid separator into a reactor while recycling, optionally, a part of the mixture into the conversion column, reacting the compressed gas phase mixture introduced into the reactor in the presence of a catalyst to produce a mixture containing MeOH, and recovering MeOH as a **liq. phase** product from the mixture

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L1             70 S CARBON MONOXIDE (L) HYDROGEN (L) CARBON DIOXIDE (L) WATER (L)
L2              2 S L1 AND LIQUID PHASE

=> s l1 and (slurry bed or slurry reactor)
         86505 SLURRY
         25750 SLURRIES
         95611 SLURRY
                 (SLURRY OR SLURRIES)
        151185 BED
         61822 BEDS
        173690 BED
                 (BED OR BEDS)
           151 SLURRY BED
                 (SLURRY(W)BED)
         86505 SLURRY
         25750 SLURRIES
         95611 SLURRY
                 (SLURRY OR SLURRIES)
        383423 REACTOR
        228531 REACTORS
        429414 REACTOR
                 (REACTOR OR REACTORS)
          1254 SLURRY REACTOR
                 (SLURRY(W)REACTOR)
L3              1 L1 AND (SLURRY BED OR SLURRY REACTOR)

=> d l3 ibib ab

L3   ANSWER 1 OF 1  CAPLUS  COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:         2002:477060  CAPLUS
```

DOCUMENT NUMBER:	137:249446
TITLE:	Kinetics of liquid-phase methanol synthesis over a Cu/ZnO/MnO3/Al2O3 catalyst
AUTHOR(S):	Nowicki, Lech
CORPORATE SOURCE:	Wydz. Inz. Procesowej i Ochrony Srodowiska, Politech. Lodzka, Lodz, 90-924, Pol.
SOURCE:	Inzynieria Chemiczna i Procesowa (2002), 23(1), 83-98 CODEN: ICPRDT; ISSN: 0208-6425
PUBLISHER:	Oficyna Wydawnicza Politechniki Wroclawskiej
DOCUMENT TYPE:	Journal
LANGUAGE:	Polish

AB Exptl. data for low-pressure **methanol** synthesis over Polish com. Cu/ZnO/MnO3/Al2O3 catalyst, obtained in a bench-scale stirred-tank **slurry reactor** were used for kinetic modeling of this process. Exptl. conditions were varied in the range as follows: slurry temperature of 493-523 K, reactor pressure of 3-5 MPa, space velocity of 0.66-3.16 10-3 m3·kg-1·s-1, and H2/CO feed gas ratio 1.6-4.0. Although it is believed that **carbon dioxide** is the main source of carbon in **methanol** synthesized on copper-containing catalysts and CO is converted to CO2 via **water** gas-shift reaction, the direct hydrogenation of CO to **methanol** cannot be entirely excluded. Thus the best way of modeling this reaction is take into account both routes. The model developed in this paper is based on three overall reactions: hydrogenation of CO and CO2, and the **water** gas-shift. A detailed reaction network, derived from mechanistic consideration reported recently in the literature, is used as a basis for the development of the rate expressions. It was assumed that **methanol** is formed from adsorbed **hydrogen** atoms and **carbon monoxide** mols. via partially hydrogenated species such as HCO, H2CO and H3CO. The surface reaction between methoxy species (H3CO) and adsorbed **hydrogen** atoms is the rate-determining step. The synthesis of **methanol** from **carbon dioxide** occurs via formate species (HCO2) adsorbed on the catalyst surface and hydrogenation of this species is the rate-determining step in CO2 hydrogenation pathway. **Methanol** desorbs leaving adsorbed oxygen atoms on the catalyst surface. These atoms can be removed by CO to give **carbon dioxide** or they react with **hydrogen** to form **water**. The kinetic model was derived by using Langmuir-Hinselwood formalism and steady-state approximation for reaction intermediates. Molar concentration of reagents in a slurry phase used in kinetic equations for elementary steps were subsequently replaced by more convenient partial pressures in a gas phase using Henry's law. The expts. were designed in such a way that all mass transfer resistances could be negligible, so it was assumed the gas phase and the liquid phase to be in thermodynamical equilibrium The kinetic model for liquid-phase **methanol** synthesis developed in this study is given in Table 1. The parameters ests. were obtained by minimizing the performance index using the exptl. determined rates of **methanol** and **water** formation. All the parameter values obtained are listed. The model accurately predicts the rate of formation of **methanol** and **water** in the whole range of operating conditions employed for this study. The quality of the fit is shown, where the exptl. values of **methanol** and **water** rates of production are plotted against the estimated ones. The model developed in the present study was used for simulation of the process to examine the effect of operating conditions on the rate of formation of **methanol** from CO and CO2. The calcn. Showed that **methanol** is formed mainly from CO2 and the extent of CO hydrogenation increased with increasing of temperature, pressure and residence time. It also depends on feed gas composition

=> d his

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     (FILE 'HOME' ENTERED AT 15:05:57 ON 14 SEP 2004)

     FILE 'CAPLUS' ENTERED AT 15:06:06 ON 14 SEP 2004

     FILE 'CAPLUS' ENTERED AT 15:06:30 ON 14 SEP 2004
L1             70 S CARBON MONOXIDE (L) HYDROGEN (L) CARBON DIOXIDE (L) WATER (L)
L2              2 S L1 AND LIQUID PHASE
L3              1 S L1 AND (SLURRY BED OR SLURRY REACTOR)

=> s l1 and inert liquid
        133856 INERT
           586 INERTS
        134289 INERT
                 (INERT OR INERTS)
        660109 LIQUID
        120283 LIQUIDS
        751153 LIQUID
                 (LIQUID OR LIQUIDS)
        912082 LIQ
         87020 LIQS
        945866 LIQ
                 (LIQ OR LIQS)
       1317126 LIQUID
                 (LIQUID OR LIQ)
          1306 INERT LIQUID
                 (INERT(W)LIQUID)
L4             0 L1 AND INERT LIQUID

=> s l1 and liquid medium
        660109 LIQUID
        120283 LIQUIDS
        751153 LIQUID
                 (LIQUID OR LIQUIDS)
        912082 LIQ
         87020 LIQS
        945866 LIQ
                 (LIQ OR LIQS)
       1317126 LIQUID
                 (LIQUID OR LIQ)
        666261 MEDIUM
          3701 MEDIUMS
        275595 MEDIA
           175 MEDIAS
        867470 MEDIUM
                 (MEDIUM OR MEDIUMS OR MEDIA OR MEDIAS)
         14819 LIQUID MEDIUM
                 (LIQUID(W)MEDIUM)
L5             0 L1 AND LIQUID MEDIUM

=> s l1 and liquid starter
        660109 LIQUID
        120283 LIQUIDS
        751153 LIQUID
                 (LIQUID OR LIQUIDS)
        912082 LIQ
         87020 LIQS
        945866 LIQ
                 (LIQ OR LIQS)
       1317126 LIQUID
                 (LIQUID OR LIQ)
          7367 STARTER
          1636 STARTERS
          8106 STARTER
                 (STARTER OR STARTERS)
```

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            11 LIQUID STARTER
                 (LIQUID(W)STARTER)
L6           0 L1 AND LIQUID STARTER

=> s l1 and liquid phase
        660109 LIQUID
        120283 LIQUIDS
        751153 LIQUID
                 (LIQUID OR LIQUIDS)
        912082 LIQ
         87020 LIQS
        945866 LIQ
                 (LIQ OR LIQS)
       1317126 LIQUID
                 (LIQUID OR LIQ)
       1519688 PHASE
        322509 PHASES
       1656330 PHASE
                 (PHASE OR PHASES)
        101714 LIQUID PHASE
                 (LIQUID(W)PHASE)
L7           2 L1 AND LIQUID PHASE

=> s l1 and catalyst suspen? (l) liquid (2a) methanol
        665986 CATALYST
        670508 CATALYSTS
        853598 CATALYST
                 (CATALYST OR CATALYSTS)
        338634 SUSPEN?
          1003 CATALYST SUSPEN?
                 (CATALYST(W)SUSPEN?)
        660109 LIQUID
        120283 LIQUIDS
        751153 LIQUID
                 (LIQUID OR LIQUIDS)
        912082 LIQ
         87020 LIQS
        945866 LIQ
                 (LIQ OR LIQS)
       1317126 LIQUID
                 (LIQUID OR LIQ)
        170202 METHANOL
           660 METHANOLS
        170548 METHANOL
                 (METHANOL OR METHANOLS)
             4 CATALYST SUSPEN? (L) LIQUID (2A) METHANOL
L8           0 L1 AND CATALYST SUSPEN? (L) LIQUID (2A) METHANOL

=> s l1 and catalyst suspen? (4a) methanol
        665986 CATALYST
        670508 CATALYSTS
        853598 CATALYST
                 (CATALYST OR CATALYSTS)
        338634 SUSPEN?
          1003 CATALYST SUSPEN?
                 (CATALYST(W)SUSPEN?)
        170202 METHANOL
           660 METHANOLS
        170548 METHANOL
                 (METHANOL OR METHANOLS)
             3 CATALYST SUSPEN? (4A) METHANOL
L9           0 L1 AND CATALYST SUSPEN? (4A) METHANOL

=> s liquid phase and methanol synthesis
```

```
        660109 LIQUID
        120283 LIQUIDS
        751153 LIQUID
                 (LIQUID OR LIQUIDS)
        912082 LIQ
         87020 LIQS
        945866 LIQ
                 (LIQ OR LIQS)
       1317126 LIQUID
                 (LIQUID OR LIQ)
       1519688 PHASE
        322509 PHASES
       1656330 PHASE
                 (PHASE OR PHASES)
        101714 LIQUID PHASE
                 (LIQUID(W)PHASE)
        170202 METHANOL
           660 METHANOLS
        170548 METHANOL
                 (METHANOL OR METHANOLS)
       1140121 SYNTHESIS
             3 SYNTHESISES
         62479 SYNTHESES
       1175511 SYNTHESIS
                 (SYNTHESIS OR SYNTHESISES OR SYNTHESES)
          3443 METHANOL SYNTHESIS
                 (METHANOL(W)SYNTHESIS)
L10        186 LIQUID PHASE AND METHANOL SYNTHESIS

=> s l10 and hydrogen (L) carbon dioxide and carbon monoxide
        835326 HYDROGEN
          5420 HYDROGENS
        838372 HYDROGEN
                 (HYDROGEN OR HYDROGENS)
       1074557 CARBON
         23925 CARBONS
       1083274 CARBON
                 (CARBON OR CARBONS)
        417334 DIOXIDE
          6352 DIOXIDES
        418937 DIOXIDE
                 (DIOXIDE OR DIOXIDES)
        195179 CARBON DIOXIDE
                 (CARBON(W)DIOXIDE)
         11370 HYDROGEN (L) CARBON DIOXIDE
       1074557 CARBON
         23925 CARBONS
       1083274 CARBON
                 (CARBON OR CARBONS)
        161023 MONOXIDE
           961 MONOXIDES
        161535 MONOXIDE
                 (MONOXIDE OR MONOXIDES)
        136127 CARBON MONOXIDE
                 (CARBON(W)MONOXIDE)
L11          3 L10 AND HYDROGEN (L) CARBON DIOXIDE AND CARBON MONOXIDE

=> d his

     (FILE 'HOME' ENTERED AT 15:05:57 ON 14 SEP 2004)

     FILE 'CAPLUS' ENTERED AT 15:06:06 ON 14 SEP 2004

     FILE 'CAPLUS' ENTERED AT 15:06:30 ON 14 SEP 2004
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L1            70 S CARBON MONOXIDE (L) HYDROGEN (L) CARBON DIOXIDE (L) WATER (L)
L2             2 S L1 AND LIQUID PHASE
L3             1 S L1 AND (SLURRY BED OR SLURRY REACTOR)
L4             0 S L1 AND INERT LIQUID
L5             0 S L1 AND LIQUID MEDIUM
L6             0 S L1 AND LIQUID STARTER
L7             2 S L1 AND LIQUID PHASE
L8             0 S L1 AND CATALYST SUSPEN? (L) LIQUID (2A) METHANOL
L9             0 S L1 AND CATALYST SUSPEN? (4A) METHANOL
L10          186 S LIQUID PHASE AND METHANOL SYNTHESIS
L11            3 S L10 AND HYDROGEN (L) CARBON DIOXIDE AND CARBON MONOXIDE

=> s l11 not l2
L12            2 L11 NOT L2

=> d l12 ibib ab 1-2
```

L12 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:86724 CAPLUS

DOCUMENT NUMBER: 132:110297

TITLE: Carbon dioxide tolerance in the single-stage **liquid-phase** synthesis of dimethyl ether

AUTHOR(S): Sardesai, Abhay; Gunda, Arun; Tartamella, Tim; Lee, Sunggyu

CORPORATE SOURCE: Department of Chemical Engineering, University of Missouri-Columbia, Columbia, MO, 65211, USA

SOURCE: Energy Sources (2000), 22(1), 77-82
CODEN: EGYSAO; ISSN: 0090-8312

PUBLISHER: Taylor & Francis Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB In the **liq.-phase** di-Me ether process, **methanol synthesis** catalyst (Cu / ZnO / Al2O3) and methanol dehydration catalyst (γ-alumina) are slurried in an inert liquid medium. The inert liquid medium used in this investigation is a white mineral oil, Witco-40. This multiphase reaction is conducted in a mech. agitated slurry reactor. In this process, syngas conversion can be significantly improved by coprodn. of di-Me ether along with methanol. The coprodn. strategy improves the thermodn. and kinetic environment of the reaction system. The effects of catalyst loadings in the slurry and the roles played by carbon dioxide in di-Me ether synthesis were studied by conducting kinetic expts. The **liq.-phase** di-Me ether synthesis process exhibits higher carbon dioxide tolerance as compared to the **liq.-phase methanol synthesis** process, whose optimal carbon dioxide concentration in the unbalanced syngas feed is around 8%. These results have been exptl. confirmed.

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L12 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1995:449971 CAPLUS

DOCUMENT NUMBER: 122:190990

TITLE: Global kinetics of **methanol synthesis** in three-phase slurry reactor

AUTHOR(S): Chen, Minsong; Ying, Weiyong; Fang, Dingye; Zhu, Bingchen

CORPORATE SOURCE: Department Chemical Engineering, East China University Science Technology, Shanghai, Peop. Rep. China

SOURCE: Ranliao Huaxue Xuebao (1994), 22(4), 380-5
CODEN: RHXUD8; ISSN: 0253-2409

PUBLISHER: Kexue

DOCUMENT TYPE: Journal

LANGUAGE: Chinese

AB The global kinetics of **methanol synthesis** from **carbon monoxide**, **carbon dioxide**, and **hydrogen** was investigated in a three-phase slurry reactor with mech. agitator. Reaction conditions were as follows: pressure 5 MPa, temperature 210-250 °C, C301 copper catalyst size 0.125.apprx.0.154 mm (100 .apprx. 120 mesh), liquid paraffin as inert **liq. phase** and speed of agitator 950 rpm. The methanol concentration in the gaseous product was 7.apprx!8%, which was higher than that in the traditional gas-solid catalytic process. By the improved Gauss-Newton method, Langmuir-Hinshelwood type global kinetic models of the parallel hydrogenation of CO and CO2 were developed in terms of fugacities of reaction components.

WEST Search History

Hide Items | Restore | Clear | Cancel

DATE: Tuesday, September 14, 2004

Hide?	Set Name	Query	Hit Count
		DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; THES=ASSIGNEE; PLUR=YES; OP=ADJ	
☐	L15	l12 and liquid medium	0
☐	L14	l12 and inert	1
☐	L13	L12 and inert liquid	0
☐	L12	3501516.pn.	6
☐	L11	L10 not l6	9
☐	L10	L9 not l7	9
☐	L9	L8 and methyl formate and cooling and recycl$3	10
☐	L8	carbon monoxide with hydrogen with carbon dioxide with methanol with water	379
☐	L7	l4 and methyl formate and recycl$3	1
☐	L6	L5 and recycl$3	5
☐	L5	L4 and (slurry bed or slurry reactor or bubble column reactor)	5
☐	L4	L3 and liquid phase with water	35
☐	L3	carbon monoxide with hydrogen with carbon dioxide with methanol	874
☐	L2	L1 and liquid phse with water	0
		DB=PGPB,USPT; THES=ASSIGNEE; PLUR=YES; OP=ADJ	
☐	L1	carbon monoxide with hydrogen with carbon dioxide with methanol	625

END OF SEARCH HISTORY

L37: Entry 1 of 1 File: USPT Jan 24, 1995

DOCUMENT-IDENTIFIER: US 5384335 A
TITLE: Methanol synthesis using a catalyst combination of alkali or alkaline earth salts and reduced copper chromite

Brief Summary Text (12):
The methanol synthesis reaction is very exothermic. Poor heat transfer in the catalyst bed results in an outlet methanol concentration limited to 5-6 mole %. Either cool unreacted gas injected at stages in the catalyst bed or internal cooling surfaces is generally used to control the bed temperature. To achieve maximum conversion of the carbon oxides, an excess of H.sub.2 is used. The excess of H.sub.2 requires a high recycle ratio which, in turn, leads to greater expense. Therefore, any modification in the process technology that can enhance heat transfer will result in higher conversions. Furthermore, a decrease in operating temperature could result in lower energy consumption and a higher equilibrium conversion.